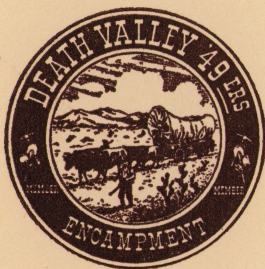


OLD HARMONY BORAX WORKS

*..... the beginning of an industry
in Death Valley and of the famous
twenty mule teams.*

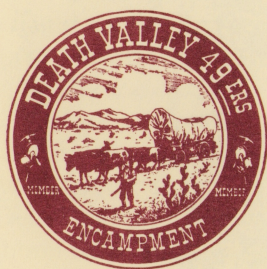


Prepared from the records of United
States Borax & Chemical Corporation

OLD

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INLAND PRINTING AND ENGRAVING COMPANY
SAN BERNARDINO, CALIFORNIA
NOVEMBER, 1962

*A twenty mule team at the Harmony Borax Works
in Death Valley. About 1885.*



Old Harmony Borax Works

"She burns green! Rosie, by God, we're rich!"

So declared Aaron Winters who in 1881 discovered that much of the white stuff lying on the floor of Death Valley was borax.

Death Valley lies in California, along the Nevada state line. It is about 130 miles long and from six to fifteen miles wide. Walling it on either side are towering volcanic mountain ranges.

The first white men who set foot in the Valley were emigrants bound for the California gold fields in 1849. Looking for a short cut across the desert, they stumbled into the Valley, and not until they found themselves trapped there did they realize their terrible mistake. When they finally managed to escape, one of the women of the party, looking back from the summit of the Panamints toward the scene of their sufferings, gave the place its name. "Good-by, Death Valley," she said.

The Paiutes who roamed the Valley before the advent of the white men called it Tomesha—Ground Afire. Before the Indians, there were other inhabitants—the unidentified men who carved the picture writings found on the rocks of the Death Valley canyons and who left crude stone tools along the shores of a once great lake.

Death Valley today has the distinction of being the lowest, hottest, driest spot on the American continent. The "elevation" at Badwater, the low point of the Valley, is 279.6 feet below sea level, the lowest point on the North American continent. From Dante's View in the Funeral Mountains, one can look down on this spot and then westward to the Sierras where the summit of Mt. Whitney rises 14,495 feet.

The Valley itself was created, according to geologists, some seven to eleven million years ago. At that time tremendous forces broke loose and changed the earth's surface. When the folding and faulting, the tilting and twisting were over, a great valley had been formed between what are now the Panamint and the Funeral Ranges.

More millions of years passed. The Valley became an inland lake, its deep waters charged with salt, borax and other minerals. Two million years ago, the waters began to evaporate leaving a salt desert. In the rocks which were once the mud of the lake bed have been found fossil tracks and bones of prehistoric animals.

It was the borax once held in those lake waters and deposited on the Valley floor two million years ago which was eventually to make Death Valley famous and open it up to the whole world.

The first man to find it there was Isadore Daunet, a Frenchman who, with five other disappointed prospectors, had quit the mining camp of Panamint City and was heading across the Valley to Arizona in midsummer, 1875. Three of the party died on the floor of the Valley. Daunet and two others, with the help of friendly Indians, managed to reach the camp of Darwin, in quite the opposite direction from Arizona. In his pockets Daunet carried out some strange white crystals he'd picked up in the Valley, near the place where the '49ers had abandoned their wagons. But no one to whom he showed them evinced any interest, and soon he threw them away.

Then, six years later, in the fall of 1881, Daunet heard some startling news. It was the story of Aaron Winters and his great discovery.

Aaron Winters was a "desert rat," eking out an existence in Ash Meadows just east of Death Valley, with his Spanish-born wife, Rosie. Their home was half dugout, half canvas lean-to; their worldly possessions a few head of cattle; their prospects for the future very dim. Then one night in 1881 a traveler on his way down the Nevada desert stopped overnight at the Winters'. They shared their meager supper with him, and afterward the men talked. The stranger spoke of the interest in borax up north and from his saddlebag took some samples of cottonball, breaking one open to show the silky crystals inside.

Aaron examined the cottonball in the lamplight. He'd seen stuff like this lying all over the floor of Death Valley.

As soon as the stranger had ridden off the next morning, he went into the Valley with Rosie to gather samples. They scraped up some cottonball from the ground north of Furnace Creek, then hurried back to their camp to make the test.

As the sun dropped behind the Panamints, Aaron poured the sulphuric acid and alcohol over the samples and with trembling hand applied a lighted match. For an instant he and Rosie held their breaths. Then Aaron let out a shout. "She burns green! Rosie, by God, we're rich!"

Winters didn't stop to stake out any claims or to file a location notice with the County Recorder. He just gathered up a sackful of samples and forwarded them to William T. Coleman in San Francisco. Within a few weeks a Coleman representative, William Robertson, appeared at Ash Meadows.

Before Robertson left for San Francisco, after inspecting the borax deposits in Death Valley, he handed Aaron Winters a check for \$20,000.

The news of Winters' discovery reached Isadore Daunet in Darwin and revived memories of the white crystals he, too, had seen in the Valley, back in the summer of '75. He enlisted four partners and hurried into the Valley where he located some 260 acres of borax near Bennett's Well. By the time Coleman's first crew arrived in the Valley with the necessary equipment for a borax plant, Daunet's Eagle Borax Company was already in operation. The Frenchman and his partners had dragged a huge iron boiling pan and some crystallizing vats across the mountains. They hired fifty men to gather cottonball from the marsh and went to work making borax. Their first shipment was so impure they could get only 8¢ a pound for it. Daunet discovered, too, that the midsummer heat in Death Valley was just as fierce in 1881 as it had been in 1875. Even if the men could stand it, the borax process couldn't. The solutions would not crystallize in temperatures of 120° and upward. Operations would have to be suspended during the summer months. The following year they did somewhat better, but it was to be their last season. Daunet committed suicide, his partners scattered, and the plant was abandoned after having pro-

duced a total output of 130 tons. Today all that remains of the Eagle Borax Works is a pile of cottonball dumped there some sixty-eight years ago but never processed.

In the winter of 1882 Coleman's men set up a plant—the Harmony Borax Works—near the marsh where Winters had gathered his cottonball. Water was piped in from a spring and soda for the process was obtained from a nearby mesa. Indians cut and piled mesquite to use as fuel under the boiler. The work of gathering the cottonball was done by Chinese workmen.

In May the crystallizing tanks at the Harmony Works were covered with layers of thick felt for insulation against the blazing heat. Workers played a hose of water continuously on the felt to lower the temperature by evaporation. But later in the season even this did no good as the temperature of the solution could not be lowered enough to cause the borax to precipitate. The plant, therefore, had to be shut down for the summer.

Luck, however, was with Coleman. Just at this juncture word came of another borax discovery in the desert east of Death Valley. Coleman bought it for \$15,000. This solved the problem of the summer layoff at the Harmony plant. When the thermometer in Death Valley soared too high to make the manufacture of borax possible, operations were transferred to the Amargosa Works, where the temperatures in June, July and August remained around a comparatively cool 110°. In autumn this plant was closed down in favor of the bigger and richer deposits in the Valley.

Two separate companies were organized—the Harmony Borax Mining Company, incorporated in May, 1884, and the Meridian Borax Company, incorporated six months later.

The Twenty Mule Teams

William T. Coleman was under no illusion as to the transportation difficulties which lay ahead when he established the Harmony Borax Works in Death Valley—probably the most



William T. Coleman, San Francisco pioneer for whom colemanite was named.

Program

DEDICATION of OLD HARMONY BORAX WORKS

(REGISTERED STATE HISTORICAL SITE No. 773)

10:00 A.M.

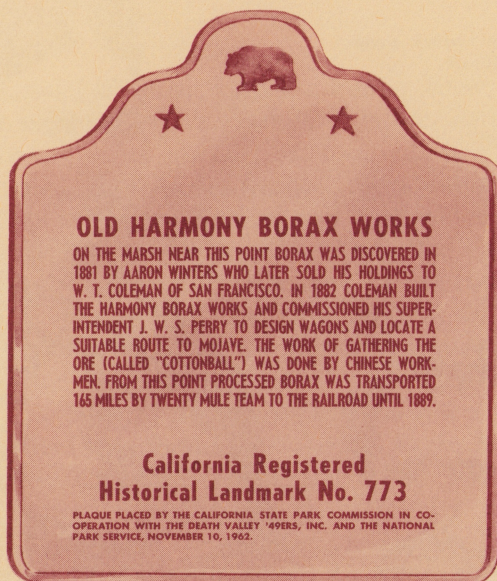
SATURDAY, NOVEMBER 10, 1962

WELCOME C. A. SCHOLL
President, Death Valley '49ers

CHAIRMAN H. P. GOWER
Director, Death Valley '49ers

GREETINGS JOHN AUBUCHON
*Superintendent, Death
Valley National Monument*

GREETINGS CHARLES BROWN
*Senator, 28th District
State of California*



- GREETINGS MAURIE L. SORRELLS
*Member, Inyo County
Board of Supervisors*
- PRINCIPAL SPEAKER HUGO RIEMER
*President, United States Borax
& Chemical Corporation*
- MONUMENT UNVEILING MRS. W. R. HARRIMAN
*Member, State of California
Beaches and Parks Commission*

Aaron Winters, Death Valley prospector, and his wife, Rosie.



remote industrial plant in America. But he knew desert men, knew there was nothing they wouldn't tackle. By the time the fires were going under the first batch of cottonball, a contract had been signed with Charles Bennett, of Pahrump, Nevada, to haul the borax to Mojave. Bennett had good mules. His wagons were not large, but neither was the output that first season. It was a satisfactory enough arrangement, except for the cost. At the end of the season, when they were ready to shift operations to the new Amargosa plant, the Company decided they could do their own hauling more economically.

They bought eight of Bennett's mules and a twelve mule outfit which had been hauling for the late Eagle Works. Along with the latter team came young Ed Stiles. The foreman at Amargosa noticed that Stiles, with his twelve animals, was hauling loads twice the size that the eight mule team did, and it set him thinking. If twelve mules could haul twice the borax that eight mules did, how much, then, could sixteen, or eighteen, or even twenty mules haul?

The following morning Stiles coupled the other teamster's wagon on behind his own, and the water wagon on behind that, then hooked up the additional eight mules to his already long string of twelve. The combined team stretched out over a hundred feet from the wagons. Could a man handle an outfit that long? Ed Stiles proved that he could. That was the beginning of the "20 Mule Teams" which became a household word and a trademark known throughout the world. Today it is still the trademark of United States Borax and Chemical Corporation.

It now remained to build wagons which would hold the tremendous loads such teams were capable of hauling. J. W. S. Perry, the local superintendent for the borax company, was commissioned to design wagons suitable for this work and to select a route to the railroad at Mojave. Each wagon was to carry ten tons—about a quarter the capacity of a modern railroad freight car. But these wagons would not be rolling on steel rails over a smooth roadbed. They would be grinding through sand and gravel, lurching over boulders, pitching in and out of chuck holes, groaning up and down steep mountain grades.

When the blueprints were finished they called for wagons with rear wheels 7 feet high and front wheels 5 feet high, each with tires 8 inches wide and 1 inch thick. The hubs were 18 inches in diameter and 22 inches in length. The spokes, of split oak, measured $5\frac{1}{2}$ inches wide at the hub and 4 inches wide at the point. The axle-trees were made of solid steel bars, $3\frac{1}{2}$ inches square. The wagon beds were 16 feet long, 4 feet wide and 6 feet deep. Each wagon, empty, weighed 7,800 pounds. Loaded with borax it would weigh 31,800 pounds. Two such loaded wagons, plus the weight of the water tank, which held 1,200 gallons and weighed 9,600 pounds, made a total load of 73,200 pounds, or $36\frac{1}{2}$ tons.

Much has been written about the romance of the twenty mule teams. But to the men who drove them they were simply a practical means of hauling some two and a half million pounds of borax from Death Valley each year. It was not until long afterward that the twenty mule team system was recognized as one of the most remarkable transportation feats in the history of the country.

The End of Old Harmony

The discovery of the Amargosa deposit convinced William T. Coleman that further prospecting should be done in Death Valley.

In December, 1882, a Coleman prospector, working his way up a small canyon on the east side of the Valley, found a new form of borax, different from the cottonball which was shoveled from the dry lake beds. This was a quartz-like mineral, occurring as an outcropping in the walls of a canyon. Assays proved it to be borate of lime, with a considerably higher boron oxide content than the cottonball ulexite. It was named colemanite, in Coleman's honor.

The strikes in the Death Valley country came thick and fast after that. Men forgot about the silver and gold in the Lost Gunsight and the Lost Breyfogle Mines. They were after borax now. In 1883, prospectors discovered a white hill in the

sedimentary formation just south of Furnace Creek Wash, its thousand-foot peak overlaid with pure ulexite. They named it Monte Blanco. Further discoveries were made along this same formation from the floor of Death Valley to the Amargosa Valley 30 miles to the east where the Lee Brothers, Leander and Philander, stumbled onto the rich borax outcrop of the Lila C. Mine. To insure title to these discoveries, government mineral surveyors spent many months in locating and mapping the claims. In Death Valley there still exist today those old mesquite markers with claim numbers burned into the weathered wood.

The discovery of colemanite had no immediate effect upon the marsh operations. It was richer than cottonball, but it required a different and far more complex refining process, and at that time the company had neither the knowledge nor the equipment to handle it. Cottonball was plentiful and familiar; at the Harmony and Amargosa works they prepared to manufacture borax on a large scale from this easily gathered material.

The mining of colemanite might have been delayed longer had not another deposit, now known as Old Borate, been discovered in 1883 in the Calico Mountains south of Death Valley by two prospectors in search of silver. The property was acquired by Coleman, who put his man Robertson to work on the problem of developing a method of refining the ore. He also bought a former soap factory in Alameda, California, to convert into a refinery. Since transcontinental freight rates were very high, it was cheaper to ship to New York from the west coast by water than by rail. Cheaper, even, to send the goods via Liverpool.

The new mine was gradually developed and by 1889 production had progressed to a point where operations at the Harmony Borax Works were discontinued.

However, Coleman was not destined to have a hand in it for in the spring of 1888, the financial world was rocked by headlines across the San Francisco papers announcing: Wm. T. Coleman and Co. Fail for \$20,000,000! The great commission

house, thought to be as solid and impregnable as the Bank of England, had crashed. Coleman summed it up simply, in an interview with reporters: "Want of immediately available cash." To finance his increasingly large and diversified interests, he had borrowed heavily both in the East and in California. Some of the banks called their loans unexpectedly. He was unable to meet the demands. Everything he owned, including his valuable borax properties, passed into the hands of assignees. Coleman himself rolled up his sleeves and went to work to pay off his creditors.

In Nevada, F. M. Smith was still busy at Teel's Marsh and Columbus Marsh leading all others in the production of borax. However, he had kept his eye on the Calico mine ever since it was located. Colemanite, he felt, was the ore of the future.

In March, 1890, twenty-two months after Coleman's failure, the entire assets of the Harmony and Meridian Borax Mining Companies were deeded to Smith. It was a big deal, including all the Death Valley and Amargosa claims, the ranch property in Death Valley, the Alameda refinery, and the Calico mine.

Smith's next step was to consolidate all these newly acquired holdings, together with his Nevada marsh properties, into one company. On September 5, 1890, incorporation papers were filed in San Francisco. The name of the new company was the Pacific Coast Borax Company, one of the predecessor companies of today's United States Borax & Chemical Corporation.

A prospectus of the new corporation indicated that the Death Valley and Amargosa deposits would no longer be actively worked but held as reserves against the future. Nothing was said about the Teel's Marsh and Columbus Marsh deposits, but it was obviously only a matter of time before operations there, too, would be discontinued. The era of marsh operations was drawing to a close. The future of the Pacific Coast Borax Company—of the whole borax industry—lay in colemanite.

The man for whom it had been named, and who had originally acquired the rich and strategically located deposit in the

Calicos, was still working doggedly to pay off his creditors. Legally he could have settled for less, but he was not content to stop until every account had been paid, dollar for dollar. It took him four years to accomplish this, but the strain, at his age, was too much for him. William T. Coleman died late in 1893. The ruins of the old Harmony Borax Works and the plaque commemorating its formation stand as a monument to one of the truly great figures in California's history.

